CLAIMS

1. A semiconductor device comprising:

a phase change memory;

an antenna transforming electromagnetic waves into AC electrical signals; and

a power supply circuit for generating power supply voltage based on the AC electrical signal which is supplied from the antenna,

wherein the phase change memory includes a plurality of bit lines that extend in a first direction, word lines that extend in a second direction perpendicular to the first direction, and phase change layers provided between the bit lines and the word lines.

2. A semiconductor device comprising:

a phase change memory;

an antenna transforming electromagnetic waves into AC electrical signals; and

a power supply circuit for generating power supply voltage based on the AC electrical signal which is supplied from the antenna,

wherein the phase change memory includes a plurality of bit lines that extend in a first direction, word lines that extend in a second direction perpendicular to the first direction, and phase change layers provided between the bit lines and the word lines; and

wherein at least one of the bit lines and the word lines transmits light.

3. The semiconductor device according to claim 1 or 2, wherein the phase change memory is provided on a glass substrate.

4. The semiconductor device according to claim 1 or 2, wherein the phase change memory is provided on a flexible substrate.

5. The semiconductor device according to claim 1 or 2, wherein the phase change layer includes a material that changes reversibly between a crystalline state and an amorphous state.

6. The semiconductor device according to claim 1 or 2, wherein the phase change layer includes a material that changes reversibly between a first crystalline state and a second crystalline state.

7. The semiconductor device according to claim 1 or 2, wherein the phase change layer includes a material that changes only from an amorphous state to a crystalline state.

8. The semiconductor device according to claim 1 or 2, wherein the phase change layer includes a plurality selected from germanium (Ge), tellurium (Te), antimony (Sb), sulfur (S), tellurium oxide (TeOx), tin (Sn), gold (Au), gallium (Ga), selenium (Se), indium (In), thallium (Tl), cobalt (Co), and silver (Ag).

9. The semiconductor device according to claim 1 or 2, wherein the phase change layer includes a plurality selected from silver (Ag), zinc (Zn), copper (Cu), aluminum (Al), nickel (Ni), indium (In), antimony (Sb), selenium (Se), and tellurium (Te).

10. The semiconductor device according to claim 1 or 2, wherein the phase change layer includes a plurality selected from tellurium (Te), tellurium oxide (TeOx), palladium (Pd), antimony (Sb), selenium (Se), and bismuth (Bi).

11. The semiconductor device according to claim 1 or 2, wherein the semiconductor device includes one or a plurality selected from a DRAM (Dynamic Random Access Memory), an SRAM (Static Random Access Memory), an FeRAM (Ferroelectric Random Access Memory), a mask ROM (Read Only Memory), a PROM (Programmable Read Only Memory), an EPROM (Electrically Programmable Read Only Memory), an EEPROM (Electrically Erasable Programmable Read Only Memory), and a flash memory.

12. The semiconductor device according to claim 1 or 2, wherein the semiconductor device includes one or a plurality of a clock generating circuit, a data demodulation/modulation circuit, and an interface circuit.

13. The semiconductor device according to claim 1 or 2,

wherein the semiconductor device includes a control circuit that controls the phase change memory; and

wherein the control circuit includes a thin film transistor.